15¢

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

A SCIENCE SERVICE PUBLICATION

MEDICINE

Onions Can Cause Anemia

► EATING LOTS of onions every day will make you anemic in a week. Four Chicago doctors, one of whom tried it himself, reported this at the Federation of American Societies for Experimental Biology meeting in Cleveland.

The doctor who had to try it on himself before giving the onion diet to volunteer medical students is Dr. M. Kalser. His colleagues in the studies at the University of Illinois College of Medicine are Drs. H. K. Ivy, D. F. Magee and A. C. Ivy.

Dr. Kalser and the medical students ate over two pounds of onions a day in addition to their regular food. They ate the onions cooked. After five days of the onions, they all felt very tired and their finger nails were pale. Blood counts showed a red cell drop of as much as a milion and a half at the end of seven days. Hemoglobin was down and there were other signs of hemolytic anemia.

The human onion-eaters got a mild anemia compared to that of dogs who ate the same amount of onions, in proportion to their weight. The dogs had a drop of 50% in hemoglobin and red blood cells at the end of 15 days.

Object of the study originally was to find a drug for patients with polycythemia who have too many red blood cells. Dr. Ivy had remembered that another scientist seeking a cure for blacktongue in dogs tried onions and reported the dogs got anemic.

Better agents for treating polycythemia have meanwhile been found. But the Chicago group will continue the onion study to find whether onions should be banned from the diets of high altitude pilots and persons doing strenuous physical work. Both conditions affect red blood cells and hemoglobin counts.

You can safely eat a piece of raw onion on your hamburger every day, the Chicago doctors feel sure. But onion oil extract, used commercially for flavoring, should perhaps be taken in considerable moderation. This oil contains the active anemia-causing principle of onions. A quarter of a teaspoon of the oil per day caused a marked anemia in dogs. Dr. Kalser said he did not dare try it in comparable doses on humans.

He and his fellow volunteers all recovered from their anemia a week or 10 days after they stopped eating so many onions.

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MEDICINE

Cortisone in Eye Drops

► ANOTHER DISEASE has yielded to cortisone, one of the "miracle hormones." Now, it appears that the substance will save the sight of thousands of children who might otherwise become blind.

The disease has a name that's a layman's nightmare: phlyctenular keratoconjunctivitis. It occurs in people with tuberculosis, particularly children, causing corneal scarring and frequent blindness.

Two doctors have found that they can clear up the disease and hold it in check simply by applying a solution containing cortisone with an eyedropper, four times a day for several days.

This appears to be the first really effective method of combatting the disease, according to a report in the AMERICAN JOURNAL OF OPHTHALMOLOGY (April) by Dr. Phillips Thygeson, of the University of California School of Medicine, and Dr. Milo H. Fritz, U. S. Public Health Service consultant at Anchorage, Alaska.

Rapid healing, usually within 48 hours, occurred in all 26 patients treated. Only two recurrences occurred, and these were quickly quelled by new treatments. Only small quantities were needed, so cost was not a major factor.

While most of the treatment was administered with an eye-dropper, some patients received injections under the membrane that lines the eyeballs. The scientists said that even in the most serious cases it does not appear to be necessary to inject it into the body so that it affects the whole system. Thus adverse reactions which sometimes result from such injections are avoided.

The physicians pointed out that cortisone does not cure the disease, which can recur so long as the individual has tuberculosis. However, it seems able to clear it up at any time and hold it in check.

The treatment will be especially useful in Alaska, where the tuberculosis rate among the Indians and Eskimos is high and there is little protection of the children from it. The physicians treated patients both in Alaska and the San Francisco area.

The disease is believed to be caused by an allergic reaction to products thrown off by the tubercle bacillus.

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GENERAL SCIENCE

Close to Five Million Wives Older Than Their Husbands

► AS MANY as 4,750,000 American wives are older than their husbands. An equal number are just as old as their husbands. The rest—about 28,500,000 women—declare and affirm that they are younger than their husbands.

This accounts for all 38,000,000 married women in the nation, a record. This figure is a high, not only in absolute numbers but also in relation to the adult population. It is also 8,000,000 more women than were married in 1940.

The chances are about two to one that these 38,000,000 women will outlive their husbands. Women who are 25 years old, however, can look forward to an expectancy of 36 years of married life first.

One in every eight of this bumper crop of married women has been married before. In one out of every six families either the husband or wife has been previously married.

A fact that has been long suspected by wary males is now confirmed—it does not necessarily take education to get a man. In 1947, 95% of the women between 35 and 44 years of age who had received only up to seven years of schooling had become wives, while only 83% of the college girls were able to get husbands.

All figures are from the STATISTICAL BULLETIN of the Metropolitan Life Insurance Company.

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CHEMISTRY

Seaweed Chemicals Goal of British Research

► NEW CHEMICALS from seaweed are expected to result from work now underway at the new Institute of Seaweed Research established with government aid at Inveresk Gate, Musselburgh, Scotland. The laboratory is designed and equipped primarily for pilot scale processes.

Agar and alginates are already in large-scale commercial production from Scotland's bountiful supply of seaweed. It is known that seaweed contains other chemical substances but commercial processes of extracting them need development. This will be the principal job of the new undertaking.

Available seaweed contains considerable amounts of alginic acid, a sugar known as mannitol, a starch called laminarin, and a new chemical known as fucoidin. Included also are smaller, and as yet unassessed, quantities of proteins, fats, sterols and amino acids.

An incomplete survey of Scotland's seaweed beds shows that probably 4,000,000 tons could be harvested. To conserve resources, not more than one-fourth of this amount should be gathered each year. A million-ton harvest would yield 200,000 tons of dry brown seaweed, which in turn would yield some 30,000 tons of alginic acid, a slightly larger amount of mannitol, and 40,000 tons of laminarin, the seaweed starch.

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Desert Institute, recently established in Egypt, is a government organization to conduct studies of the Egyptian *deserts* in respect to geology, geography, geophysics, water supply and agriculture.

MEDICINE

Blood Difference in Cancer

Reversal of Proteus immune reaction offers hope of combining with protein measuring methods for good cancer detection testing of population.

➤ A BLOOD difference between untreated cancer patients and almost all the rest of the population, sick or well, has been discovered by scientists at Yale University School of Medicine, New Haven, Conn.

The difference is easily detected and may lead to a screening test for unsuspected cancer in large groups of people, as X-rays are now used to screen unsuspected tuberculosis patients in the population.

The difference the Yale scientists have found is the way the blood serum of cancer patients acts when mixed with Proteus antigen or vaccine. Proteus is the name for a large family of microorganisms. Some of them cause disease, others do not.

When a few drops of blood serum from a normal person is mixed with the Proteus material in a test tube, in a large percentage of cases there is a clumping, scientifically called agglutination. Blood serum from a large percentage of cancer patients does not react this way.

This gives a different kind of measure from other tests developed for cancer detection. Many tests now under study are for detection of changes in blood proteins developing specifically with cancer. The Yale test measures something normally present which disappears with cancer. Although not 100% accurate itself, it may prove very useful when given with one of the tests for protein changes. The combination of tests for two different mechanisms would be more useful, cancer authorities say, than a combination of several different tests for protein changes.

The Protein reaction difference was discovered by Drs. I. A. Parfentjev, E. E. Cliffton and F. Duran-Reynals. They report details in the journal SCIENCE (May 4).

The Proteus clumping ability of blood serum disappears early in cancer and is more apparent early than late, Dr. Parfentjev said. This will add to the value of the difference if it becomes a cancer detection test, since early cancer is hardest to diagnose and also the most easily cured.

The test can be made easily in a few minutes with only a few drops of blood and the testing material is easily available.

Babies and children under five mostly have not developed Proteus clumping ability in their blood, the Yale scientists find. But 95% of normal grown-ups, and 14 out of 15 pregnant women, do have it. Patients with tuberculosis, mental sickness, non-cancerous growths and cancer patients after removal of the cancer have the Proteus clumping material in their blood.

Tests have been made on more than 500 persons with success, but many more hundreds of tests must be made before this Proteus reaction can be accepted as a cancer detection test. At present Dr. Parfentjev is working on a method of measuring another blood difference between cancer patients and normal persons. This combined with the Proteus test may give a more accurate test than either one alone.

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AGRICULTURE

Electrified Dusts to Give Better Plant Disease Control

➤ BETTER CONTROL over insects and plant diseases is expected through use of electrically charged dusts. The process, to be field tested commercially this summer, gives five to ten times better coverage than normal dusting with fungicides and insecticides in laboratory tests.

Fine dust particles are charged with from 12,000 to 20,000 volts as they emerge from the nozzle of a regular commercial dusting machine. The high charge is held for several seconds. Since the dusts are blown at a velocity of about a mile per minute, they travel a great distance before losing their electrical charge.

Plants develop the opposite charge, thus attract the charged particles. The underside of leaves and the sides of the plant opposite the stream of dust also draw the particles to give excellent overall coverage.

Credit for the idea of using electrically charged particles for dusting with insecticides and fungicides goes to Henry D. Bowen, graduate research asisstant at Michigan State College, East Lansing, Mich. An electrical precipitation process is used in many industrial plants to keep the soot from coming out of smoke-stacks, and Mr. Bowen based his dusting process on this principle.

A thin wire in the center of the dusting nozzle carries from 12,000 to 20,000 volts at very low wattage. Power consumption is very low and makes the apparatus even safer than an approved electric fence. A tractor battery system in conjunction with a dynamotor and a high voltage direct current power supply is sufficient for a four-row duster. Engineers estimate that the cost of necessary electrical attachments for the ordinary four-row duster would run around $300.

Laboratory tests showed 11 times as much dust deposited on plants at four feet distance when particles were charged than when the same apparatus was used with no charge applied to the insecticide.

In a wind tunnel test under ideal conditions, more dust was accumulated on plants at 32 feet from the nozzle when particles were charged than at four feet away when uncharged. Scientists feel certain that the effective charge can be retained in the dust particles long enough to dust tree tops.

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ELECTROSTATIC DUSTING—Henry D. Bowen, Michigan State College graduate assistant, who developed the electrostatic dusting process, shows here how the method works. The apple on the left became coated when held in the charged dust, while the one on the right, although receiving the same amount of uncharged dust, remained uncoated.

MEDICINE

Chemical Stops Polio Virus

➤ THE FIRST chemical that will stop the growth of infantile paralysis virus in human tissue without damaging the tissue was reported by Drs. Gordon C. Brown and W. W. Ackerman of the University of Michigan to the Federation of American Societies for Experimental Biology meeting in Cleveland.

The chemical is ethionine, a relative of methionine, which the body uses in building up proteins.

Ethionine will not be used to treat polio patients until further tests have been made with it and similar compounds in animals, according to a statement by Dr. Brown.

The results he reported were from tests with small pieces of tissue growing outside the body. This did not take so much ethionine. Enough of the chemical to stop virus growth in the whole body "would probably produce undesirable results," Dr. Brown explained.

The importance of the finding, in his opinion, is that it "opens the door" to a research approach that may lead to discovery of a safe anti-polio drug. This is the growing of polio virus in human tissue outside the body. The technique is used in very few laboratories. In most laboratories, monkeys are used for study of the behavior of the polio virus and of the effects of various drugs on it.

Ethionine, Dr. Brown reported, stops the polio virus by acting on the human tissue cells. The drug's interference with chemical reactions in these cells keeps the virus from getting growing material.

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CHEMISTRY

Trace Metallic Impurities

➤ TINY TRACES of metals in new and used lubricating oils and other traces that may exist in pulverized catalyst used in gasoline cracking were matters of grave concern to petroleum chemists at the meeting of the American Petroleum Institute, Tulsa, Okla. Spectographic means are now successfully used in their detection.

The amount of iron found in crankcase drainings is an indication of the wear taking place in the engine during operation. A knowledge of the amount and type of wear is important to both engine designers and manufacturers of lubricants.

A rapid, accurate method of determining the iron content of used lubricating oils was described by John Hansen, Paul Skiba an C. R. Hodgkins, Standard Oil Development Company, Linden, N. J. It is a spectrochemical method, which can be used to measure very low and relatively high iron concentrations without any variations in the technique.

In the present-day manufacture of petroleum products, minute traces of metallic substances often influence greatly the methods and costs of processing or the quality of these products, the Institute was told by E. L. Gunn, Humble Oil and Refining Company, Baytown, Texas.

He referred to very finely pulverized dry material used in the so-called fluid-catalytic cracking of petroleum oils to produce the components of gasoline as an example. The presence of only a few pounds of trace metals, such as iron or sodium, in a ton of the catalyst may have an adverse effect on the quality and distribution of the cracked products obtained.

He described an emission spectrographic method by which as little as one part of chromium in 100,000 parts of catalyst can be detected. In the process a very small amount of the catalyst is subjected to the high heat of an electric arc. The spectrum of light given off by the incandescent vapors is used to identify and measure the elements present in it.

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PHYSICS

New Fundamental Particle

Anti-proton becomes fifteenth elementary particle of matter. Negative counterpart of the heart of the hydrogen atom tracked on one cosmic ray photograph.

➤ THE LATEST and fifteenth elementary particle of matter is the anti-proton, or the negative counterpart of the heart of the hydrogen atom.

So far it is known by only one track on a cosmic ray disintegration photograph made by Dr. Robert B. Leighton, physicist at the California Institute of Technology.

This was in the decay of another seldom-photographed cosmic ray particle, called the neutral V particle. The negative proton track was like a conventional hydrogen heart track but its direction in the magnetic field showed that it was opposite in electric charge. Scientists never see the particles themselves, only the swath they cut in the photographic emulsion.

Only when many more such tracks are found will the discovery of the anti-proton be claimed.

There are three kinds of V-particles known, positive, negative and neutral. They are called V-particles because they form V-shaped tracks on the photographs of atomic disintegrations by which we know most about the constitution of matter. When Drs. G. D. Rochester and C. C. Butler of the University of Manchester, England, found them four years ago they were called heavy mesons. But the V-particles, all three kinds—positive, negative and neutral—are sufficiently different from the other mesons, known by the Greek letters mu and pi, to be considered a different breed of particles.

All of these particles with mass, with the exception of the stable electron, proton and positron (positive electron) are very short-lived. Most of them exist less than a millionth of a second. The neutron, which triggers the atom bomb, can live about 20 minutes.

The anti-proton, now being sought, would have a short life. That is one of the reasons that it is hard to find. Dr. Carl D. Anderson of the California Institute of Technology, who won a Nobel prize for his discovery of the positron, expected the anti-proton to be found.

The anti-proton would be rated as the fifteenth elementary particle, if there are included the photon which is the massless "particle" of radiation, and an undiscovered entity, also without mass, called the neutrino which is required to balance out disintegrations from atomic collisions.

The anti-proton would be 1,845 times the mass of the electron, as is the proton, but it would have a negative charge upon it instead of the positive charge upon the proton.

Scientists travel to the tops of high mountains or send cosmic ray recorders to great heights by balloons, which are mistaken for "flying saucers." They do this to catch on sensitive photographic plates the debris of atom smashing caused by the mysterious cosmic rays from outer space that come into the top of our atmosphere most strongly.

Dr. Leighton reported to the American Physical Society meeting in Washington, D. C., that he has found 53 V-particles among thousands of cosmic ray photographs taken.

A team from the University of Manchester took cosmic ray recording apparatus to the top of Pic-du-Midi in the Pyrenees. They recently reported that in six months they captured 43 of the V-shaped particle tracks.

Attention is being paid to these very infrequent and very technical happenings because that is the only way that we discover the constitution of the matter of the universe in the hope of molding it for use in peace and war.

Almost as "unpractical" experiments gave the world the information about the fission of uranium out of which grew the atomic bomb.

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TECHNOLOGY

Rubber-Fabric Drums Replace Metal Ones

➤ RUBBER-FABRIC drums, suitable for replacing the metal drums now widely used in shipping liquids, have been developed by the United States Rubber Company. They have capacity for 55 gallons, and after shipping can be returned for reuse.

When empty they collapse. Some 2,500 of the collapsed drums can be shipped in a single box car that would hold only 300 of the common metal drums. This means a great saving in freight costs.

These rubber drums are suitable for the shipment of petroleum products, oils, greases, fats, acids, paints, emulsions, soaps, dry powders and a variety of pharmaceutical and industrial chemicals. They are tough, light in weight, easy to lift, roll, handle and stow. They are made of material that is non-corrosive, non-absorbent and resistant to weathering.

The material is strong, low-stretch cotton textile impregnated with synthetic rubber and molded in one piece. Handles are provided so that the drums may be easily carried.

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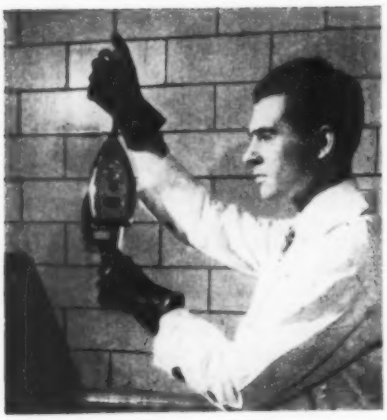
RUBBER SHIPPING DRUM—The new 55-gallon rubber drum suitable for shipping liquids is shown in three stages. At left is a filled drum, in the foreground, a collapsed drum, and at the right a drum being filled, for which no vent is needed. Since the drums collapse when empty, valuable shipping space can be saved when they are being returned.



ELECTROPLATED METAL—The gleaming finish on this electric iron cover shows the metal plating technique developed by engineers of Westinghouse Electric Corporation. The new method is expected to save huge quantities of nickel, a strategic metal.

TECHNOLOGY

New Electroplating Method Uses Less of Critical Metals

➤ STRATEGIC NICKEL, now in short supply for non-defense applications, is conserved in a new method of electroplating automobile bumpers and other objects which results in a satisfactory, bright, corrosion-resistant trim. The process saves other critical metals also.

The process was developed by Westinghouse Electric Corporation, Pittsburgh, Pa. The resulting trim has very thin coatings of copper, nickel and chromium. A layer of copper about one-thousandth of an inch thick is electroplated to the steel base. Over this is put a layer of nickel about one-half as thick. Then an extremely fine film of chrome is applied.

The key feature of the new plating system, according to George W. Jernstedt of the Westinghouse staff, is an electrical "back-stroke" that alternately applies metal then takes some of it away by reversing the current. The use of the electroplating current in reverse is a relatively new process for giving a bright smooth finish to electroplated coatings.

In ordinary methods of electroplating a continuous flow of direct current is sent through the electrolytic bath until a coating of the desired thickness is obtained. Surfaces obtained are lumpy when examined under a microscope and have to be polished. The new process, by alternately giving and taking away metal, conserves metals, eliminates the lumps and results in a surface requiring no hand or machine polishing.

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MEDICINE

Mass Screening Unsound

➤ MASS TESTING of the population for detection of half a dozen or more diseases at one time is criticized by Dr. Wilson G. Smillie, professor of preventive medicine and public health at Cornell University Medical College, New York, in a report to the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (April 21).

Tuberculosis, syphilis, diabetes, cancer and heart disease are among the serious diseases covered in plans for mass multiple screening tests, or "multiphasic" screening tests as they are also called.

As a primary public health diagnostic function, a multiphasic diagnostic screening unit is "unsound in its concepts; untenable in its principles and indefensible in its logic," Dr. Smillie declares.

Advantages, Dr. Smillie points out, are: low per capita cost, detection of serious unsuspected disease, speed and education of the public.

Disadvantages, which Dr. Smillie thinks outweigh the advantages, are: 1. Lack of selectivity. Syphilis, for example, is essentially a disease of young men and women in the lower economic and social group. Mass blood testing of persons over 40 for detection of syphilis is foolish. Mass tests for early detection of cancer in persons under 35 is also "futile," Dr. Smillie thinks.

2. Mechanistic basis which fails to take account of man as a person rather than a series of organs.

3. False sense of security given the 960 or so of every 1,000 who emerge from the screening with negative results. Negative tests have little value, which the average person does not know.

Having health departments make tests and then refer the patient to the physician is a cart-before-the-horse arrangement, Dr. Smillie points out. It takes a physician familiar with the patient's personality, history and family background to make a diagnosis of health or sickness. The health department should make tests to aid the physician's diagnosis, not the other way around.

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GEOLOGY

More Mineral Prospecting

➤ MINERAL PROSPECTORS, from lonely "sour-doughs" to highly-equipped geologists, are expected to become very active again in the near future with financial aid from the government. They will be searching for new sources of minerals needed in the defense program.

Regulations and terms under which the federal aid will be given have just been issued by the U. S. Department of the Interior. Application blanks have also been prepared. All participants, individuals or mining operators, must file on this blank prepared by the Defense Minerals Administration.

This office is in the Department's Bureau of Mines. Proposed projects by applicants will be investigated and defined by the Bureau of Mines and the Geological Survey before contracts are made.

The percentage of funds to be supplied by the government in proportion to the total cost of an approved project depends upon the minerals being sought, and varies from 50% to 90%.

The government contribution is 50% for chromium, copper, fluorspar, graphite, iron, lead, molybdenum, sulfur, zinc and cadmium.

For antimony, manganese, mercury and tungsten, a 75% contribution will be made. For uranium, important in atomic energy development, a 90% contribution will be made by the government.

Other minerals in the 90% classification include spinning-grade asbestos, beryl, cobalt, columbium-tantalum, corundum, cryolite, industrial diamonds, strategic kyanite, strategic mica, nickel, platinum-group metals, piezo-electric quartz crystals, steatite and tin.

The applicant's share of the cost may be in the form of labor at reasonable rates, rental of equipment owned by him, and similar contributions in kind as well as cash. The applicant must own land on which to prospect, or have land available under a proper lease.

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MEDICINE

Heart Can Absorb a Drug, Break It Down to Compounds

➤ FIRST EVIDENCE that the heart can absorb a drug and break it down into other compounds has been obtained from radioactive digitoxin from the University of Chicago's "atomic farm."

Digitoxin is the most active compound in the familiar heart medicine, digitalis. It is obtained from the foxglove plant. The plants were made to produce radioactive digitoxin by making them breathe radioactive carbon dioxide.

From 40% to 50% of the drug was converted to other compounds by the heart, Dr. A. Sjoerdsma of Michael Reese Hospital, Chicago, and Dr. Conrad C. Fisher of the university, reported at the meeting of the Federation of American Societies for Experimental Biology in Cleveland.

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ENGINEERING

High Heat Damages Tanks

► EXTREME HEAT, delivered inside an enemy armored tank on the battle field, is responsible for perhaps the principal damage from the discharge of America's Big Bazooka, according to Walter H. Ramsey, Army Aberdeen Proving Ground, in an article in ORDNANCE magazine (May-June).

The Big Bazooka is a 3.5-inch version of the device found effective against enemy tanks during World War II. However, it is a much more powerful weapon than its predecessor, more power being needed to penetrate the heavier armor plate now used on Soviet tanks. It has been in constant use in Korea since July, 1950. The missile of the Big Bazooka can penetrate the armor of a modern tank, pass through the air space within, and then penetrate an additional several inches of armor.

The bazooka is a rocket-firing tube which in use passes over the shoulder of the user, projecting to the rear and well to the front. The tube is aimed on a target by the soldier using a telescopic sight on its side. Squeezing a trigger starts the rocket on its way. Its penetrating power does not come from its speed but from a funnel-shaped explosive charge at its forward tip.

The Big Bazooka is fired electrically by the current generated when the gunner squeezes the trigger of the small magneto firing mechanism, Mr. Ramsey states. Ignition of the propellant charge is accomplished by an electric squib which ignites a small charge of black powder which, in turn, ignites the propellent charge.

When the rocket strikes a tank, the fuze plunger, located at the base of the warhead, flies forward and drives the firing pin into a small detonator, exploding the booster, which, in turn, detonates the explosive charge in the head.

The explosive charge is cone- or funnel-shaped by a metal liner. When it detonates, a small jet about one-tenth of an inch in diameter forms at the apex of the cone and travels forward at a velocity of approximately 25,000 feet a second, he states. It is this jet of gas and particles that penetrates the armor.

In passing through the insides of a tank, the extremely-hot jet can cause much damage to the mechanisms within and also to fuel tanks and ammunition. It is extremely difficult to protect fuel and ammunition from the heat of the jet, he declares.

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TECHNOLOGY

Bottled Gas For Bus Fuel

► BOTTLED GAS, now being used in millions of rural homes, is destined to replace in large measure gasoline as fuel for city buses and trucks, it was predicted at the meeting of the American Petroleum Institute, Tulsa, Okla. Its use for the purpose has already passed the experimental stage.

Scientists call this fuel liquid petroleum gas, LPG for short. These petroleum gases are taken from the ground along with the crude oil, and are also produced as a by-product of gasoline manufacture. They were formerly burned in the open because no uses for them had been found.

With the passing of the years, however, a multitude of uses have been found, the meeting was told by Eugene S. Corner, Standard Oil Development Co., and E. H. Berg, Esso Standard Oil Co., New York. Certain constituents of petroleum gas can be liquefied by pressure and shipped and used from portable tanks with safety.

Chemically LPG is composed of propane and butane. If produced at a refinery it often contains propylene and butylenes as well. It is less expensive than gasoline and gives better mileage per gallon of fuel, they stated. It is a very clean burning fuel, permitting operations with an absence of disagreeable exhaust odors.

It is estimated that there is 0.9 gallon of LPG available from our current petroleum reserves for every gallon of gasoline, the scientists were told by R. C. Alden, Forrest E. Gilmore and Paul Tucker, Phillips Petroleum Company, Bartlesville, Okla. Recovery today is only one-fourth the amount available. Full recovery and use would increase the life of our petroleum reserves by more than 50%, they indicated.

Internal-combustion engine designers have long recognized the need for a fuel which possesses high-octane rating, resistance to detonation, and ideal combustion characteristics, Robert S. Lee, Twin Coach Company, Kent, Ohio, stated. Propane, a common liquefied petroleum gas, possesses these advantages.

The propane fuel system is not complex, he said. The use of propane as an engine fuel promises the commercial fleet operator lower fuel costs, maintenance savings, the widest possible safety in handling, plus public acceptance.

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● RADIO

Saturday, May 19, 1951, 3:15-3:30 p. m., EDT

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Mr. Kenneth C. Spengler, executive secretary of the American Meteorological Society, will discuss "Doing Something About the Weather."

ELECTRIC HELMSMAN — Lieut. Comdr. W. M. M. Fowden, Jr., demonstrates one of the units by which ships can be steered from widely-separated positions on board.

MILITARY SCIENCE

Remote Control Steers Vessel From Many Positions on Ship

► A WAR vessel in action with its normal steering station disabled by enemy fire, can now be steered from many positions in the ship. For the purpose, an electric remote control is used. The device is worn on the chest of the user and is plugged into outlets which provide connections to a special steering power unit in the steering engine room.

It is a development of the General Electric Company, Schenectady, N. Y., and is now being fitted on a destroyer for Navy use. An earlier model has been successfully tested on a similar Navy vessel during the past two years.

This "electric helmsman" can be used at various times for various uses. It can be utilized for effective "close-in" direction of intricate maneuvers such as docking, breeches buoy transfers and other normal or emergency movements.

Science News Letter, May 12, 1951

VETERINARY MEDICINE

One-Shot Vaccine Protects Dogs Against Distemper

► A ONE-SHOT vaccine to protect dogs against distemper is now available. It is a live virus vaccine, but through passage on embryonated chick eggs, it has been modified so it will not cause distemper. It is capable of giving lasting immunity against this common, very contagious and often fatal disease of dogs. Previous distemper vaccines have been produced mainly from ferrets. The new one is also recommended for ferrets and mink, Lederle Laboratories, manufacturers, state.

Science News Letter, May 12, 1951

MEDICINE

Two New Drugs Help Fight Heart Disease

➤ TWO NEW drugs for the fight against heart disease were reported at the meeting of the Federation of American Societies for Experimental Biology in Cleveland.

One is called triethanolamine trinitrate. From laboratory tests it promises to have a more lasting effect in dilating the heart's blood vessels than nitroglycerine, one of the standard chemicals used to treat the heart disease called angina pectoris. The tests were reported by Drs. K. I. Melville and F. C. Lu of McGill University, Montreal.

The other drug, commercially available under the name, Myocardone, is extracted from beef hearts. Drs. Allen Weiss, David H. Feldman and Frederick Steigmann of Cook County Hospital, Chicago, tried it on 58 patients. They reported the following results: Definite improvement in the patient's feeling in two-thirds of the angina patients; mild to moderate improvement in patients with high blood pressure symptoms; little improvement in patients with acute decompensated heart conditions, two of whom died.

Science News Letter, May 12, 1951

INVENTION

Patent Bag to Cool Water For Summer Picnickers

➤ FOR SUMMER campers without ice or cold spring water, and also for dwellers in remote arid sections, is an improved cloth water bag with which water leakage through the fabric is at the evaporation rate on the outer surface. It is this evaporation, as is well known, that causes the cooling of the water in the container.

The new bag is inexpensive because it is made of cotton. Special chemical treatment is applied to the fabric which causes the fibers to swell up in contact with water enough to close the interstices between the fibers and prevent excessive leaking. Charles J. Kintner, Birmingham Township, Pa., and William P. Hall, Wilmington, Del., received patent 2,550,697 on this invention. Patent rights are assigned to Joseph Bancroft & Sons, Wilmington.

Science News Letter, May 12, 1951

PUBLIC HEALTH

Discuss Protection of Water From Enemy Contamination

➤ PROTECTION against contamination of the nation's water supplies by enemy saboteurs was discussed in three days of closed sessions by the annual conference of state sanitary engineers in Washington, D. C.

In open sessions, they took up problems like water pollution by natural methods.

Their problem of defense against this type of biological warfare is not one of devising entirely new methods. Already the closest, constant supervision is kept up over water supplies in order to prevent the spread of the many natural diseases which used to plague man. The same principles now in use in this work would apply to defenses of the water systems against biological warfare.

The state of scientific knowledge on the spread of natural disease is such, according to bacteriologists, that we need have little fear of man-made epidemics getting out of hand, whether they are spread through the water system or not.

It is their belief that no mysterious new disease can be sprung on the nation by any enemy. Our defenses are based on the assumption that any biological warfare attacks will utilize diseases already known to scientists.

Cooperating with the state sanitary engineers in their meeting were Vincent Lamoreux, Federal Civil Defense Administration sanitary engineering expert, and scientists from the Federal Public Health Service.

Science News Letter, May 12, 1951

VOLCANOLOGY

Volcano, Now Peaceful, Outblasted Atom Bomb

➤ HOW AN explosive volcanic eruption, one of the biggest in historic times in North America, galvanized the people of Central America into action was described to the American Geophysical Union meeting in Washington, D. C.

In 1835 the eruption occurred on a remote peninsula of the coast of Nicaragua. The story of its impact, gleaned from historical sources and from a study of the now peaceful volcano, was related by Dr. Howel Williams, University of California volcanologist.

The eruption plunged all of Central America into darkness for several days, darkness caused by the eruption of some two and a half cubic miles of ash in just two or three days. The ash fell over an area 1,700 miles in diameter.

The explosion was so loud it was heard in Jamaica, where part of the British fleet, at anchor, put out to sea in the belief that the island was being bombarded by cannon.

In the British Honduras and in Guatemala City the loud report caused the army to be called out to repel what was believed to be an attack.

A large number of concubines in Salvador made frantic efforts to get married, in the belief that the end of the world was at hand.

The volcano, called Consequina, was 15 miles in diameter at the base. The great eruption drained the subterranean chamber, and the top of the original mountain collapsed into it. Today, Consequina is a peaceful scene, with a deep blue lake at the bottom of a 2,000-foot-deep pit.

Science News Letter, May 12, 1951

IN SCIENCE

MEDICINE

Old Drug Is Now New High Blood Pressure Treatment

➤ AN OLD abandoned drug has been modernized into effective treatment for cases of high blood pressure in which heart failure or brain hemorrhage threatens.

The drug is called Protoveratrine. Modern chemists have purified it from a substance from a common European weed. And a majority of 25 patients with severe high blood pressure have their blood pressures reduced by it. Dr. Sibley W. Hoobler of the University of Michigan reported these results at the meeting of the American Federation for Clinical Research in Atlantic City, N. J.

Headaches, confusion and convulsions were relieved, along with reduction of blood pressure, as long as the patients took the drug. They got it in tablets to be taken three times a day.

Protoveratrine is not yet available for general practice and its use must be strictly supervised. It is not for the mild case of high blood pressure nor, Dr. Hoobler said, for severe cases until other treatments have been tried.

The drug was first given in "shots" by Dr. Otto Krayer of Harvard Medical School in 1949. Tablets of it, to be swallowed instead of injected with a needle, were supplied Dr. Hoobler by Eli Lilly and Co. of Indianapolis.

Science News Letter, May 12, 1951

MEDICINE

Oust Cockroaches To Be Rid of Polio-Like Disease

➤ GET RID of cockroaches to escape a polio-like disease. This, in effect, is the warning from research supported by the National Foundation for Infantile Paralysis, New York.

In the laboratory, cockroaches can spread Coxsackie virus, Dr. Robert G. Fischer of the University of North Dakota School of Medicine and Dr. Jerome T. Syverton of the University of Minnesota School of Medicine discovered.

The Coxsackie group of viruses cause a disease with symptoms identical to non-paralytic poliomyelitis. Whether roaches spread these viruses, and perhaps even the polio virus itself, in homes and restaurants under non-laboratory conditions is not yet known. The possibility is now being investigated by Dr. Syverton and associates.

Details of their laboratory findings are reported in the AMERICAN JOURNAL OF TROPICAL MEDICINE (May).

Science News Letter, May 12, 1951

ENCE FIELDS

MEDICINE

Chemicals in Tire Rubber Found to Cause Cancer

➤ EIGHT CHEMICALS known or suspected of being cancer-causing have been discovered in the processed rubber of an automobile tire and some rubber stoppers, three University of Chicago scientists reported to the American Association for Cancer Research meeting in Cleveland.

The chemicals were found in benzene extracts of the tire and stoppers. The extracts had been investigated because of their strong fluorescence. When painted on the skin of mice, the extracts caused cancers.

Tracking the cancer-causing chemicals further, the scientists traced them to carbon black, one of the raw materials used in processing rubber. Some of the chemicals are weak cancer-causers, some turned out to be inactive and some have not yet been tested. One of the group, benzpyrene, is known to be a strong cancer-causer.

Of three types of carbon black tested so far, all of them furnace blacks, two of large-particle size contained all the eight chemicals. The third, of small-particle size, contained only two.

Knowledge of the factors responsible for the presence of cancer-causing chemicals in carbon black will, the scientists pointed out, help evaluate possible health hazards in the industries concerned.

The scientists who have been investigating processed rubber and carbon black are Drs. Hans L. Falk, Paul E. Steiner and Sam Goldfein.

Science News Letter, May 12, 1951

MEDICINE

Cancer Advances Reported During Fund Campaign

➤ RECENT CANCER news: 1. A cell test for stomach cancer found 17 cancers, missed two, in trial on 235 patients with various stomach symptoms. It will get further trial and technical improvement under a National Cancer Institute grant of $20,000 to the University of California at San Francisco for researches by Drs. Herbert F. Traut and Milton Rosenthal.

2. Delayed fertilization of animal egg cells produces such freaks of growth as two-headed monsters, spare legs and extra arms and cancer. But the trend toward cancer can be reversed completely by refrigerating the eggs. The research, on amphibians, is expected to give more knowledge of cancer cause and prevention in man. The work has been done by Dr. Emil Witschi of the State University of Iowa, aided by a grant from the American Cancer Society.

3. Chemists who have developed many cancer-causing compounds in the search for better insecticides, dyes and other industrial products heard of a potential vitamin pill-defense against such compounds. Large doses of vitamin B-2, or riboflavin, seem able to detoxify the cancer-causing chemical, 2-acetylaminofluorene, and keep it from causing cancer in rats, Prof. James B. Allison and Arthur W. Wase of Rutgers University, New Brunswick, N. J., reported to the American Chemical Society.

4. Failures in X-ray treatment of cancer due to radiation resistance of the cancers may be prevented in future by pre-X-ray doses of male or female hormone. The male hormone would be given to women, the female hormone to men patients if results with mice work out in humans. This finding is by Mrs. Ruth Graham of Massachusetts General Hospital, Boston, whose studies are partially supported by the American Cancer Society.

Science News Letter, May 12, 1951

PHYSICS

Mirages Come Regularly Each Day at Puerto Penasco

➤ GO TO Puerto Penasco if you want to see mirages loom up every day and disappear just as regularly. Puerto Penasco is on the Sonoran shore of the Gulf of California.

Atmospheric conditions dictate the mirage performance, Ronald L. Ives of Cornell Aeronautical Laboratory, Buffalo, N. Y., told the American Geophysical Union meeting in Washington, D. C.

Images of mountains in Baja California, normally hidden below the horizon, regularly loom into visibility under a decrease in temperature with height. The stronger the drop-off in temperature, the greater the possibility of the mountain mirages. As night comes and when the temperature conditions start to reverse, the mountains sink below the horizon. Other types of mirages are also regularly visible at Puerto Penasco, Mr. Ives said.

Science News Letter, May 12, 1951

INVENTION

Take Vitamins as Coating On Grains of Table Salt

➤ THE VITAMINS needed by the human being can now be taken at the dining table as a coating on the grains of ordinary table salt. This vitamin-coated salt is designed to make up for the vitamins lost in cooking of vegetables. Vitamins taken with the salt are claimed to be more effective than those taken in pills because they are thoroughly mixed with the food in a natural manner. Patent 2,550,726 was awarded Merton A. Searle, St. Paul, Minn., for the invention.

Science News Letter, May 12, 1951

NUTRITION

Garden Lettuce Yields Vitamins and Minerals

➤ IF YOU have a garden you are probably planning to grow some lettuce this summer, and gardenless city dwellers will be buying and eating more of this refreshing vegetable as the weather grows warm and appetites grow finicky.

Lettuce is more than an appetizing background to a salad or a hot weather meal. Nutritionists at the University of New Hampshire remind us that there is considerable vitamin A in lettuce, quite a lot of some B vitamins, such as folic acid and riboflavin, and some vitamin C.

There is also some vitamin K, and a little vitamin E present. As far as minerals are concerned, lettuce is an excellent source of iron, copper, sodium, and magnesium. There is not too much protein present, but this small amount is more valuable to the body than larger amounts in some other vegetables. Lettuce contains some fiber, but it is very easily assimilated by the digestive system. The carbohydrate content is not very high, but it is in a readily-available form. In other words, lettuce will not make you fat.

Lettuce originally came from India, but it has been cultivated for a long time. It is said that Augustus, the first Roman emperor, was cured of a sickness by lettuce prescribed by his physician. Probably the emperor would have survived even if he had not eaten lettuce, but it certainly popularized its use in Rome.

Today we recognize four different types of lettuce—leaf lettuce grown by the homemaker, the leaf-shaped cos lettuce used by people from the Mediterranean country, and two types of head lettuce, butterhead and crisp head. Practically all the lettuce grown on the general market is of the crisp-head type, commercially, but incorrectly, called Iceberg.

Science News Letter, May 12, 1951

MEDICINE

Rats, Also, Drink When Life Gets Too Rough

➤ RATS, LIKE many humans, will take to drink when life gets too rough. Studies showing this were reported by Drs. Bernice M. Doucet, Hershel G. Tree and Paul L. Ewing of the University of Texas Medical Branch, Galveston, at the meeting of the American Society for Pharmacology and Experimental Therapeutics in Cleveland.

Allowed a free choice of water or alcohol, the rats took a little more alcohol when learning a multiple-T maze with electric and ear-splitting sound shocks to stimulate their performance.

The scientists interpret the alcohol drinking "as a result of psychic stress" rather than a disturbance of body chemistry.

Science News Letter, May 12, 1951

AVIATION

Better Jet Engines Needed

Ability to fly fast and high is a prime aviation requisite in modern warfare, lessons from Korea show. Speeds faster than sound must soon be possible.

By A. C. MONAHAN

▶ ABILITY to fly fast and high is a prime aviation requisite in modern warfare, it has been amply shown by experiences in Korea. This means jet planes. Jet-propelled fighters have been found far superior to fighting planes of the conventional types.

Design is important for such planes, but no matter how good the design may be, the fighter is no better than its engine. That is why research work in developing better engines must proceed at full speed. Engines twice as powerful as those in use are required. The hopeful fact is that they may be available in the near future.

Fundamental in aviation is the fact that at high altitudes faster speeds can be made. These speeds mean more safety in surprise attacks for the plane and its occupants. Detection and interception by enemy aircraft or anti-aircraft fire is made more difficult.

Speed Is Essential

Speed makes it possible for a fighter to overtake an enemy plane being followed or to escape from difficult situations when escape is essential. Speeds approaching that of sound are now attainable by fighter planes. But planes of the future must travel faster than sound.

Russia, as well as America, has fast planes. Dr. Hugh L. Dryden, director of the National Advisory Committee for Aeronautics, gave recent warning that in Korea, Russian-built aircraft as fast as the American F-86 Sabre are in action. The United States must make every effort to maintain superiority in aircraft engines, he said.

Jet airplane designers are not satisfied with the 11,000 horsepower engine that drove the Bell X-1 faster than sound, he stated. Engines producing 20,000 to 30,000 horsepower are in the offing. Another important problem to be solved, he added, is to make the jets more economical with their fuel, and to make them entirely of raw material available in America.

Jet planes have other advantages in warfare over those equipped with the ordinary piston-engine besides speed and altitude ability. In a recent statement made by Maj.-Gen. Roger M. Ramey of the U. S. Air Force, he indicated that his branch of the armed services is convinced that the jet has proven its worth as a tactical weapon in many ways.

"It delivers its fire power better than conventional aircraft, as the location of the machine gun in the nose of the aircraft gives a far greater concentration of fire than wing guns," he stated. "The jet aircraft provides a steady gun platform, which allows the pilot to hold his fire on small targets without continually having to trim his aircraft for changes of speed and altitude.

"The wide speed range of jet aircraft enables pilots to adjust the speed of their attacks according to prevailing circumstances. The forward and downward visibility in a jet is far better than that of single-seat conventional aircraft, as there is no cowling to obstruct the pilot's view. The absence of engine noise is a boon to the pilot in reducing combat fatigue."

However good present jet planes are, better types are necessary if America is to hold air supremacy. Extensive research in both plane designs and in engine and fuels is a prime necessity. Dr. Jerome C. Hunsaker, chairman of the NACA, said in a recent report of that organization that if air research is curtailed during the present emergency to the same extent that it was during World War II, America's future air power position will be precarious.

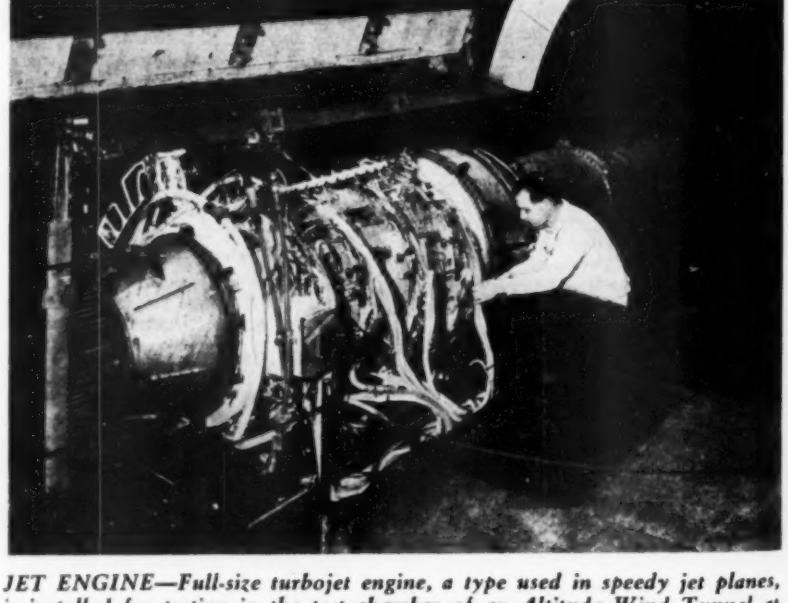
Great improvement must be made in jet engines, the report states, before the Air Force can have really practical combat planes that can fly faster than sound.

The National Advisory Committee for Aeronautics is a government agency for fundamental studies in aerodynamics including aircraft design, power plants and fuels. It maintains three large research centers, including one at Cleveland, Ohio. Work on engines and fuels is concentrated at it. Millions of dollars are invested in equipment at this center. There is no cheap way to develop planes or engines. The essential wind tunnels alone cost millions.

Largest in the World

A notable tunnel at this laboratory, largest of its type in the world, has a test chamber six feet wide and eight feet high, big enough to hold a full-size jet engine under operating test. It is a supersonic tunnel in which air velocities up to 1,500 miles an hour can be obtained.

This is about twice the speed of sound at sea level. It picks up at one end as much as 2,000,000 cubic feet of air per minute and returns it to the atmosphere at the other. Ordinary wind tunnels for testing models of planes and plane parts are "closed" affairs in which the same air is used over and over again. That type can not be used with operating engines be-



JET ENGINE—Full-size turbojet engine, a type used in speedy jet planes, is installed for testing in the test chamber of an Altitude Wind Tunnel at NACA Lewis Flight Propulsion Laboratory, Cleveland. The hinged curved cover is closed before test runs.

cause the air becomes polluted with the discharge of combustion.

Cold air is big business, important business, at this NACA Lewis Flight Propulsion Laboratory at Cleveland. Without the enormous quantities of refrigerated air made each day, it would be impossible to carry on the vital research needed to help America's aviation industry to build the more powerful jet engines of tomorrow.

Jet engines of today and tomorrow will have to be completely dependable at altitudes of 50,000 feet and higher. They will have to function at temperatures of 65 degrees below zero Fahrenheit as well as at surface temperatures. At an altitude high enough to give this low temperature, the air is so thin that a man would suffocate immediately. Ordinary electric circuits just will not work at such altitudes.

Biggest Refrigerating Plant

To supply the cold air needed in engine development, the Lewis Laboratory has four costly cold-making installations. One of these is the biggest refrigerating plant in the world. It can produce at capacity the equivalent of 30,000,000 pounds of ice every 24 hours.

This installation contains a battery of 14 centrifugal compressors, each rated at 1,500 horsepower. A total of 30 tons of Freon 12, a non-toxic refrigerant, is required. A centrally-located control room rations out the cold air to more than 100 test installations at the laboratory which require it. Temperatures involved in testing range from 90 degrees above zero Fahrenheit to 108 degrees below zero. The installation was made by Carrier Corporation, Syracuse, N. Y.

The Lewis Laboratory at Cleveland is, of course, not the only agency conducting fundamental research in aviation engines. Both the Air Force and the Navy have laboratories doing important and outstanding work. Also there are many educational institutions, private organizations and aviation industrial laboratories making important contributions to the future of flying.

Notable among aviation laboratories in research work are those of the U. S. Air Force at the Wright-Patterson Air Base, Dayton, Ohio. Included in its equipment is what is called an all-weather laboratory which can produce any type of weather found anywhere around the globe and simulate altitudes up to 150,000 feet.

Weather Conditions Simulated

This Environment Laboratory, as it is called, contains 14 weather chambers. Most of these chambers are cubical affairs about eight feet in size into which airplane and engine parts, and instruments, can be placed for testing under conditions ranging from Sahara dry to jungle wet and Arctic cold. Plate glass fronts aid observations.

Each chamber is for particular tests. Some are low-temperature chambers in which temperatures down to minus 112 degrees Fahrenheit can be obtained. In one, the temperature can be dropped from that of the ordinary room to 65 degrees below zero in five minutes.

Then there is an all-weather chamber with extreme range in temperature but in which 100% relative humidity can be made. A sand and dust chamber has relatively no humidity and its temperature range extends from 70 degrees to 185 degrees Fahrenheit. A salt fog chamber simulates coastal conditions. A fungus chamber maintains conditions favorable to the growth of fungus encountered in various parts of the world and permits testing of plane parts in a fungus-laden atmosphere.

The sun and rain chamber is of particular interest. Within it, rain from a quarter of an inch to four inches an hour can be provided under various temperatures. "Sun" is provided by a strong mixture of ultraviolet and infrared radiation. Within the chamber, conditions can be reproduced equivalent to the sun's rays at noon when the sun is just over the equator.

Brine Circuits Maintain Cold

Important in this all-weather laboratory is the refrigeration system supplying low temperature brine for cold weather testing. Extreme low temperatures are achieved by operating three Carrier Corporation centrifugal refrigeration machines in series. Two independent brine circuits are maintained, one of which is kept constantly at ultra-low temperatures. The other provides brine at a maximum of 30 degrees above zero. In both, the brine is methylene chloride, dyed with red oil so that leaks can be detected.

The need of continuous research in military planes and their engines is emphasized by the fact that these weapons must be always in condition to operate in any part of the world. Also that the plane taking off from a tropical desert or jungle at high temperature may within a few minutes be high above the earth at temperatures far below zero. Engines that function under all conditions are essential.

Science News Letter, May 12, 1951

MEDICINE

New Drugs Combat Effects Of Deadly Chest Disease

➤ A NEW disease, a result of our increasingly complex industrial life, has been retarded by the new drugs ACTH and cortisone. A pulmonary chest disease, it is called chronic berylliosis.

It attacks the lungs and occasionally other parts of the body. Small amounts of beryllium, a metal now being used in copper and other alloys, sometimes get into the bodies of workers and others who have contact with it.

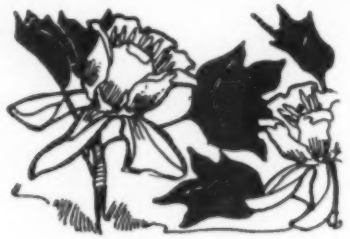
The new treatment was reported by Dr. H. E. Tebrock of Sylvania Electric Products, Inc., at the Industrial Health Conference in Atlantic City, N. J.

Dr. Tebrock reported that other treatments had been unsuccessful, but that patients responded well to first ACTH and then cortisone.

Science News Letter, May 12, 1951

BOTANY

NATURE RAMBLINGS



Tulip Tree

➤ ALL THROUGH the whole eastern part of the United States, and well into the West where men have seen fit to plant them as ornamentals, tulip trees are coming into bloom. It can be spotted as a somewhat rough-barked but tall and stately tree, big as a cottonwood, with a vast bed of tulips plucked up off the ground and scattered carelessly about over its crown.

Although the gorgeous magnolias of the South do not venture very far north, the tulip tree, a fairly near relative, upholds the family traditions through a wide stretch of country well above the Mason-Dixon line. West of the Mississippi it occurs naturally little if at all, but will thrive as a cultivated tree as far west as one can grow six-foot cornstalks, and it deserves wide acquaintance. It does receive full appreciation in the cities of the East, however. Its only drawback in the windy stretches of the prairie states is that winter storms will sometimes break off branches, for the wood is short and rather brittle.

Though this weakness of its wood precludes it from consideration as a first-rank hardwood, the tulip tree still has a useful place as a timber producer. Its fiber is even and smooth and rather soft, which makes it nice material for the veneer knife. For this reason, and because it is a fast grower, the tulip tree is being cultivated to some extent on cut-over lands as a regular timber crop.

The tulip tree is also variously known as tulip poplar, yellow poplar, whitewood and fiddle-tree. The latter name is in recognition of its very odd leaves, which with their squared or slightly bifurcated ends and constricted sides have some faint suggestion of a violin shape about them. The Greek name which Linnaeus gave it, however, is a bit of classic poetry to the sensitive ear—Liriodendron. It means "lily tree."

The beautiful flower-cups whence the tree gets both the commonest of its common names and its classical title are of about the size and shape of tulips, and have colors that no tulip need be ashamed of. In their internal structure, however, they are quite different. Instead of the triple arrangements of stamens and pistil parts, they have indefinite numbers arranged in spirals. This is a mark of relatively primitive rank in the evolutionary scale of plants; and, indeed, the tulip tree is placed by botanists very near to the front of the book, along with its magnolia relatives.

Science News Letter, May 12, 1951

TECHNOLOGY

Less Gasoline Needed For High Compression Engines

➤ CARS OF the future with engines having a 12-to-1 compression ratio will permit a saving of 30% in the amount of fuel required, the American Petroleum Institute meeting in Tulsa, Okla., was told by Charles L. McCuen of General Motors Research Laboratories. They will require, however, a fuel of high octane number.

Road and laboratory tests already made with a 12-to-1 compression ratio engine were reviewed by him. The engine, mounted in a 1951 standard Cadillac sedan chassis, registered 29 miles per gallon at 30 miles per hour and about 20 miles per gallon at 70 miles per hour. Aiding the engine to achieve these records, an improved type of automatic transmission was used.

The 12-to-1 compression engine will not be put into production in the immediate future, however, because the needed high-octane gasoline is not generally available. Before it can come into wide use, the petroleum industry will have to manufacture larger quantities of this fuel and provide for its distribution and sale at roadside gasoline stations.

"We believe that commercial development within the next few years will be found somewhere between our present production designs of 7.5-to-1 compression ratio and the compression ratios represented by these experimental 12-to-1 engines," Mr. McCuen said.

Science News Letter, May 12, 1951

MEDICINE

Eat Vitamins Regularly To Reduce Craving for Drink

➤ EAT YOUR vitamins regularly and you won't crave drink. This advice is based on studies reported by Drs. E. O'Malley, V. Heggie, M. Trulson, R. Fleming and F. J. Stare of the Harvard School of Public Health, and the Alcoholic Clinic of Peter Bent Brigham Hospital, Boston.

Noting that rats voluntarily took more alcohol when half-starving on a "marginal diet" and took less when huge doses of vitamins were given, the Boston scientists tried giving vitamins to 50 chronic alcoholics. About half the alcoholics were given huge daily doses of most of the known vitamins. The same number got mock-vitamin pills. After several weeks, the two kinds of pills were reversed. Those that had been getting vitamins got none, the others got the vitamins.

Result: Less craving for alcohol in many patients when getting the extra vitamins. Most of them getting the vitamins also reported feeling better. The studies were reported at the meeting of the Federation of Societies for Experimental Biology, Cleveland.

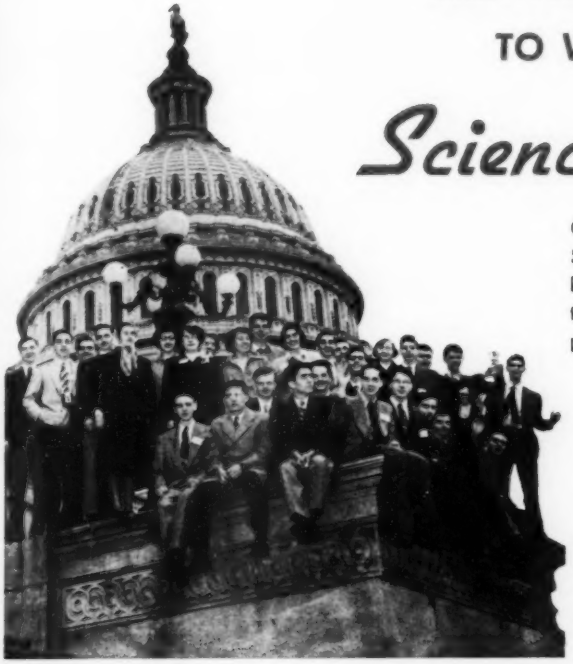
Science News Letter, May 12, 1951

SENIORS OF 1952

Start Now on YOUR SCIENTIFIC PROJECT

TO WIN in the *Eleventh* ANNUAL

Science Talent Search



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1. Pick a subject that you can investigate at first-hand, preferably one about which you can do more than just read. Typical projects of Science Talent Search winners have been in such fields as Aeronautics, Agriculture, Astronomy, Botany, Chemistry, Electronics, Geology, Mathematics, Meteorology, Medical Sciences, Nutrition, Photography, Physics, Psychology, Radio, and Zoology.

2. Whatever your project may be—read about it. Learn what has already been done. It is often desirable to repeat previous experiments, but it should be done deliberately and for a purpose.

3. Write what you did, not merely what you read. Tell it in simple language; follow it through step by step. Then tell what you observed as a result of your experiments, and what conclusions you draw from these observations.

4. Fancy writing has no place in science. There has been great writing in the sciences but it is the greatness of strength and simplicity.

WRITE A REPORT of about 1,000 words on the subject, "MY SCIENTIFIC PROJECT." Your report should tell what you are doing or plan to do in science in the way of experimentation or other research activity. It should be original and creative in character. Now, before the school year ends, is the time for high school seniors of 1952 to get started on science projects. With an early start you can plan a project, carry it through more carefully, write a better report on it. Next December take an examination which tests your ability rather than your fund of information. Supply your school with information about yourself to be sent in with your report and examination papers.

Do these three things and you may be among the forty boys and girls who will win all-expense trips to the Science Talent Institute and compete for scholarships for the continuation of your education. Of the forty, one will be selected as winner of the $2,800 WESTINGHOUSE GRAND SCIENCE SCHOLARSHIP; another as winner of the $2,000 WESTINGHOUSE GRAND SCIENCE SCHOLARSHIP; eight more of the forty boys and girls will be selected to receive WESTINGHOUSE SCHOLARSHIPS of $400 each; and $3,000 more in WESTINGHOUSE SCHOLARSHIPS will be awarded at the discretion of the judges. Every one of the forty boys and girls will, when in Washington, be awarded the GOLD EMBLEM OF SCIENCE CLUBS OF AMERICA.

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CHEMISTRY

Water Purifying Tablets

➤ A NEW type of water purification tablet will soon be issued to soldiers in Korea. The new tablet contains iodine instead of chlorine and is said to be more effective against amoebic and other dysentery and diarrhea. It will also taste better.

A large order of about 3,000,000 bottles of the new pills are "in the pipeline" now, the Army says, and more will go into production soon.

Development of the new tablet was first announced back in November, 1946, by the Army's Quartermaster Corps. However, world-wide tests had first to be taken before the iodine pill proved out.

Scientists, both outside the Army and in, say that while the new pill will be better, no chemical can be expected to rid all of the water which combat soldiers run up against of all dysentery and diarrhea-producing factors.

However, the new iodine tablets are expected to be somewhat more effective, especially against the cysts which produce amoebic dysentery, than are the presently-used Halazone tablets containing chlorine. This is mainly a matter of taste.

Enough Halazone tablets added to unsafe water to be effective against cysts will give an unpleasant taste to the water. Soldiers are sometimes reluctant to drink this purer, but unpleasant-tasting water. The iodine pills, however, in effective amounts, will not be so unpleasant.

The Army's Surgeon-General's office believes that its record against dysentery and diarrhea in the Korean war is much bettter than during World War II. Between June, 1950, and February, 1951, the rate for these two diseases was 47 soldiers per 1,000 per year. For troops in Asia in 1943, the rate was 181 per 1,000, and in 1944, 93 per 1,000. They attribute this decrease to three reasons: Halazone was not in general use until 1945, Army engineers have pushed their water purification units closer to the front lines, and more is known about preventive medicine today.

However, front line troops cannot depend on engineer purification units. In areas where water is very highly contaminated, even if they follow directions, some dysentery and diarrhea will get through.

The new iodine pills were first developed by Dr. Gordon M. Fair, of Harvard. They contain triglycine hydro-periodide.

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MILITARY SCIENCE

Army Makes Better Use Of Technical Enlisted Men

➤ THE ARMY is making much better use of enlisted scientific and technical personnel than it is of officers with these capabilities.

A new, generally efficient system has been set up since World War II to make it as certain as possible that draftees with scientific, engineering or other professional education will be used in jobs fitted to their ability. On the other hand, the system used for reserve officers reporting to duty does not guarantee that their capabilities will be most efficiently used.

It is now mandatory that all men with scientific or professional capabilities entering the Army in an enlisted status—draftees, from the enlisted reserves or through the National Guard—be reported to Washington. Formerly, these men were then transferred to Fort Myer, Va., given a job classification which suited their education and abilities, and then assigned to jobs where they could do the most for the Army.

Now, so many of them are coming into the Army that the classification and assignment is done by mail. More than 1,000 draftees have been handled by this remote control method during the first month of its operation, just ended.

In some cases a draftee has capabilities too high for any enlisted grade jobs in the Army. However, he has the opportunity to receive officer training, provided he qualifies physically.

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On This Week's Cover

➤ A GIANT centipede, approximately seven inches long, displays its antennae in the picture on the cover of this week's SCIENCE NEWS LETTER. Its bite is poisonous. This specimen came from Colombia.

PHYSICS

Find Positive Electron Exists For Very Short Time as Gas

➤ EXISTENCE OF one of the fundamental particles of nature, the positron or positive electron, as a gas was presented to the American Physical Society meeting in Washington, D. C. by Dr. Martin Deutsch of the Massachusetts Institute of Technology.

"Positronium" is the name given to this atom which can be considered a new chemical element. Free positronium atoms exist for about ten millionths of a second before they become annihilated. The positronium atoms were identified in nitrogen gas.

The positron was first found in 1932 and it is rated as a stable particle in the same class with the electron and the proton. It has the same mass as the electron, which is one in mass on the scale used to measure the elementary particles of matter.

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Books of the Week

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWSLETTER, 1719 N St., N. W., Washington 6, D. C. Ask for free publication direct from issuing organizations.

DRY-FLY TROUT FISHING — William W. Michael—*McGraw-Hill*, 191 p., illus., $3.50. A book for the novice as well as the experienced fisherman. If you have never fished with a dry fly, the author believes you are missing a lot of fun.

THE FIELD OF CHEMICAL HYGIENE—Henry F. Smyth, Jr.—*Mellon Institute*, 2 p., illus., paper, free upon request to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa. An article on industrial toxicology reprinted from Chemical and Engineering News.

THE GROWTH, REPLACEMENT, AND TYPES OF HAIR—J. B. Hamilton and others—*New York Academy of Sciences*, 290 p., illus., paper, $4.00. Reports on various aspects of hair in humans and animals.

HEATING, VENTILATING, AIR CONDITIONING GUIDE 1951—*American Society of Heating and Ventilating Engineers*, 1456 p., illus., $7.50. A handbook of technical data prepared for the profession.

HOW ABOUT THE WEATHER?—Robert Moore Fisher—*Harper*, 186 p., illus., $3.00. New York's Weather Man has written a foreword to this book which tells what is behind your favorite topic of casual conversation.

THE IDEA OF PSYCHOSOMATIC MEDICINE—Curt S. Wachtel—*Froben*, 239 p., $5.00. The author attempts to discuss the relation of medicine to religion and to present a new philosophy of the soul in the art of healing.

LARGE QUANTITY RECIPES—Margaret E. Terrell—*Lippincott*, 414 p., $7.00. If you want to plan food for a crowd, this book by the director of dining halls, University of Washington, will tell you how to cook soup in three-gallon lots, biscuits by the 5-pounds, chow mein in 30-pound lots, and pies eight at a time.

LEPROSY—E. Grunberg and others—*New York Academy of Sciences*, 142 p., illus., paper, $2.75. Reports presented at the first U. S. conference on leprosy.

THE ORCHIDS OF MAINE—Jean Elizabeth Wallace—*University Press*, 80 p., illus., paper, $1.00. Although most people think of the tropics as the only home of the orchids, this book shows that many grow as far north as Maine, but they are in danger of being wiped out because of over-picking.

PESTICIDE HANDBOOK—Donald E. H. Frear, M. Frances Sunday and Sidney Friedman, Eds.—*Commercial Printing*, 158 p., paper, $1.00. A reference book for those concerned with pest control.

THE PROBLEM OF ECONOMIC INSTABILITY—Emile Despres and others—*James Washington Bell*, 33 p., paper, 25 cents. Prepared by a subcommittee of the American Economic Association.

QUANTUM THEORY—David Bohm—*Prentice-Hall*, 646 p., $10.00 Developing the precise nature of three new quantum-theoretical concepts. It was the author's purpose to express the main ideas of the quantum theory in non-mathematical terms, but he found that some mathematics is needed.

SYMPOSIUM: Applied Research, Atomic Energy—Robert E. Wilson and Sumner T. Pike—*National Association of Manufacturers*, 22 p., paper, free upon request to publisher, 14 West 49th St., New York 20, N. Y. Addresses given at the 55th Congress of American Industry.

WATCH OUT FOR THE WEATHER—Jacqueline Berke and Vivian Wilson—*Viking*, 226 p., illus., $2.95. Telling in light vein the author's ideas on the effects of weather on our lives.

WHAT THE CLASSROOM TEACHER SHOULD KNOW AND DO ABOUT CHILDREN WITH HEART DISEASE—*American Heart Association*, 11 p., illus., paper, single copies free upon request to publisher, 1775 Broadway, New York 19, N. Y. Crowded classrooms are among the conditions that can lead to a "strep" infection, often the forerunner of rheumatic fever.

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MEDICINE

Discover Method of Staving Off Leukemia-Caused Death

➤ DEATH MAY be staved off a little longer for some of the thousands of child leukemia victims in the country as a result of researches at the U. S. National Cancer Institute.

No cure for this cancer-like disease of the blood is promised yet. But a way has been found to prolong the lives of leukemic mice from 200% to 300%. An equal reprieve for a child may let him live until a real cure is found—or a treatment of more lasting benefit.

The new way to slow down leukemia in mice is to give a combination of anti-leukemic drugs. Some of them are called folic acid antagonists, or "anti-folics." They include aminopterin, a-methopterin, and a-denopterin. Their parent compound is folic acid, one of the B-complex vitamins.

Already widely used in leukemia, they have the disadvantage that leukemic cells develop resistance to them and then the drugs lose their effects. The patients relapse and die.

Studying the leukemic cells of mice, Dr. L. W. Law of the National Cancer Institute found the cells developed their resistance when the mice were getting the largest dose of anti-folics they could tolerate. The resistance, moreover, was stable and inheritable. It remained unchanged when the cells were transplanted through 33 successive generations of mice deprived of anti-folics.

Yet these cells were sensitive to other anti-leukemic chemicals, such as guanazolo, alpha peltatin and triethylene melamine, known as TEM for short.

Mixing these and anti-folics in the biggest tolerated doses caused no resistance and prolonged the survival time of the mice by 200% to 300%. Dr. Law reported details of his studies at the meeting of the American Association for Cancer Research in Cleveland.

Science News Letter, May 12, 1951

Microwaves used in television transmission are about the length of a cigarette.

• New Machines and Gadgets •

For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N ST., Washington 6, D. C. and ask for Gadget Bulletin 569. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

WATER MERRY-GO-ROUND, for children at the beach, is a four- or seven-foot inflatable tube on which are mounted four or six multi-colored, legless horses. Units are inflated separately. The inflated horses form safe saddles for youngsters between their high-held heads and erect tails.

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BOTTLE UNCAPPER and recapper is a cigarette-long device with a rounded head on one end which is used as a bottle opener. The base, which is hollow and within which a strong plunger is concealed, acts as a recapper. The removed cap is re-usable because it is not damaged in removal.

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VINYLITE PAINTS, factory fused-on awnings for windows and porches, provide longer life and better appearance than fabric awning with ordinary coloring. These resin-based paints make the awnings resistant to moisture, mildew, weather and atmospheric conditions.

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PACKAGING, which permits delicate instruments to be dropped safely from airplanes, holds the object between two elastic diaphragms by controlled and variable air pressure within two interlocking shells of metal, plastic or paper. The diaphragms are sealed to the outer shell.

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LIGHTWEIGHT slicing machine for use in stores, largely aluminum, has a weighing device in combination with it so that the slices cut off are weighed as they are made. Parts can be easily removed for cleaning.

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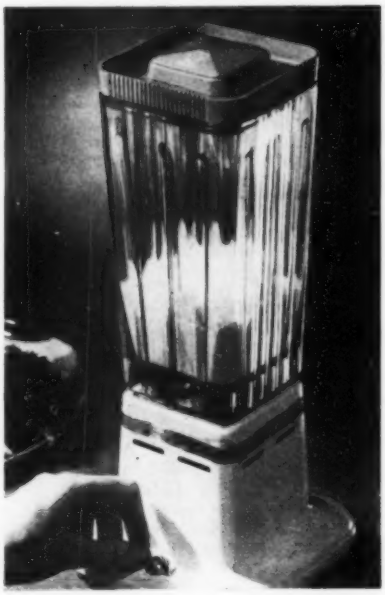

KITCHEN BLENDER, for use in preparing drinks and various foods, has a square-shaped, quart-size bowl of transparent plastic with steel blades mounted in the bottom. The bowl fits over a motor shaft from a white metal base, as shown in the picture. Its high-speed blades will liquefy, chop, grind, or whip fruits and vegetables quickly.

Science News Letter, May 12, 1951

BOOKMARK, a flexible plastic device which comes in many colors, will show both page and line at which reading ceased. It is a flat arrow with a flap grip on one end, to fit over the top of a page, and a slidable disk on its shaft with a pointer to indicate any particular line.

Science News Letter, May 12, 1951

TWO-CYCLE, air-cooled diesel engine, developed by the U. S. Air Force, will operate with any type of liquid fuel used by the armed services, including diesel and jet fuel, kerosene and 100 octane aviation gasoline. Change from one fuel to another requires minor readjustment of injection timing.

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Do You Know?

Crayfish are a serious problem in some irrigation ditches; they dig by day and by night and develop leaks in dikes.

Motor vehicles contribute to air *pollution* from exhausts fouled by smoke, and by carbon monoxide and other gases due to improper engine adjustment.

Some 18,000 acres of reclaimed land in Greece, formerly too alkaline to produce *rice* but now "washed" with fresh water, are expected this year to yield 20,000 tons of this essential food.

A modified live virus *vaccine*, claimed to give lasting immunity against distemper in dogs, has been developed.